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August 2, 2005

Mr. Jim Tischler  
California Regional Water Quality Control Board  
North Coast Region  
5550 Skyline Boulevard, Suite A  
Santa Rosa, CA 95403

RE: **Quarterly Summary Report – Second Quarter 2005**  
SECOR Project No.: 77CP.60007.03.0249

Dear Mr. Tischler:

On behalf of ConocoPhillips, SECOR International Incorporated (SECOR) is forwarding the quarterly summary report for the following location:


**Service Station**

76 Service Station No. 11249

**Location**

1300 Farmers Lane  
Santa Rosa, California

Sincerely,  
**SECOR International Incorporated**

  
Rusty E. Benkosky, P.E.  
Principal Engineer



Attachments: SECOR's *Quarterly Summary Report – Second Quarter 2005*

cc: Ms. Shelby Lathrop, ConocoPhillips (Electronic Upload into Webextender)  
Mr. John Anderson, County of Sonoma, Public Health Division, 3273 Airway  
Drive, Suite D, Santa Rosa, CA 95403  
Mr. Mark McKormick, Santa Rosa Fire Department, 955 Sonoma Avenue, Santa  
Rosa, CA 95404  
Mr. Kyle Christie, BP (Electronic Upload into Enfos)

## QUARTERLY SUMMARY REPORT Second Quarter 2005

76 Service Station No. 11249  
1300 Farmers Lane  
Santa Rosa, California

City/County ID: Santa Rosa/1TSR053

County: Sonoma

### SITE DESCRIPTION

The site is an operating 76-branded gasoline service station located on the northeast corner of the intersection of Farmers Lane and Valley Street in Santa Rosa, California. Site features include a convenience store, two service bays, two dispenser islands, and underground storage tanks (USTs). Properties located in the vicinity of the site consist of residential and commercial developments. Matanzas Creek is located adjacent to the site to the north.

The site was previously occupied by a Mobil Oil service station until 1992, at which time BP acquired the property and assumed service station operations and management of ongoing environmental work. Tosco Marketing Company (Tosco) acquired the property on July 22, 1994. Tosco discontinued the distribution of gasoline fuel products containing methyl tertiary butyl ether (MtBE) at the site on April 18, 1998 (Environmental Resolutions Inc. [ERI], *Soil and Groundwater Investigation Report*, May 25, 2000).

### PREVIOUS ASSESSMENT

An unauthorized release filed by Mobil Oil on September 2, 1987 indicated the occurrence of a release of unknown quantity due to the failure of product piping associated with the 10,000-gallon gasoline UST and the 280-gallon waste oil UST (EMCON, *Baseline Assessment*, December 27, 1994).

In August 1988, Kaprelean Engineering, Inc. (KEI) observed the excavation and removal of one steel 280-gallon waste oil UST. One soil sample collected at the base of the UST excavation (10 feet below ground surface [bgs]) contained petroleum hydrocarbons as oil and grease and trichloroethane (KEI, *Soil Sampling Investigation*, August 23, 1988). Stockpiled soil contained 110 parts per million (ppm) total petroleum hydrocarbons and diesel (TPHd) and 3,800 ppm total recoverable petroleum hydrocarbons (TRPH, KEI, *Stockpiled Soil Sampling*, September 8, 1988). The removed waste oil UST was replaced with a new 1,000-gallon double walled fiberglass waste oil UST installed in 1988 (EMCON, *Baseline Assessment Report*, December 27, 1994).

In October 1991, EMCON supervised the drilling and installation of one groundwater monitoring well (MW-1) in the vicinity of the former waste oil UST. With the exception of

detections of specific metals and 1,2-dichloroethane (1,2-DCA) in groundwater, petroleum hydrocarbons were not detected in soil and groundwater (EMCON, November 19, 1991).

During November 1992, Alisto Engineering Group (Alisto) supervised the installation of three groundwater monitoring wells (MW-2 through MW-4) at the site. The boreholes were advanced to approximately 28 feet bgs. Analysis of soil samples indicated the presence of total petroleum hydrocarbons as gasoline (TPHg) at 140 ppm, and ethylbenzene at 0.46 ppm. TPHg and benzene were detected in groundwater up to 89 parts per billion (ppb) and 1.4 ppb, respectively (Alisto, *Preliminary Site Assessment Report*, January 27, 1993).

In January 1999, ERI supervised the removal of one 1,000-gallon used oil UST, which was observed to be intact with no visible holes or cracks. Soil samples collected from beneath the UST contained TPHd, TPHg, and ethylbenzene up to concentrations of 312 ppm, 2.3 ppm, and 0.011 ppm, respectively. This used oil UST was not utilized by Tosco between July 1994, and the time of its removal (ERI, *Environmental Work Associated With Used-Oil Underground Storage Tank Removal*, April 20, 1999). Tosco was subsequently named as a responsible party for the ongoing investigation and mitigation of impacts beneath the site (Regional Water Quality Control Board - North Coast Region [RWQCB-NCR], October 4, 1999).

In November and December 1999, ERI oversaw the removal and replacement of product lines and dispensers, and collected soil samples from the trenches and beneath the dispensers. Soil samples contained up to 605 ppm TPHg, 0.0204 ppm benzene, and 0.477 ppm MtBE.

In March 2000, ERI supervised the drilling of eight soil borings (B-4 through B-8, and MW-5 through MW-7). Three of the borings were converted to groundwater monitoring wells (MW-5 through MW-7), completed at a depth of 47 feet bgs. Petroleum hydrocarbons and MtBE were detected in soil and groundwater beneath the site (ERI, *Soil and Groundwater Investigation Report*, May 25, 2000).

In June 2001, ERI supervised the installation of two additional wells (MW-7D and MW-10) and two dual completion monitoring wells (MW8S/D and MW9S/D). Soil samples were not collected during drilling. Post-development groundwater samples contained up to 130 ppb TPHg and 33 ppb MtBE.

In July 2002, one extraction well (EX-1) and one observation well (OB1) were installed at the site. Concentrations of TPHg and MtBE were reported in soil samples up to 64 milligrams per kilogram (mg/kg) and 0.96 mg/kg, respectively.

In October 2002, ERI drilled and sampled two direct push soil borings (GP-1 and GP-2) on the west side of Farmers Lane opposite the site. The borings were respectively advanced to 28 and 32 feet bgs. Petroleum hydrocarbons and MtBE were not detected in soil samples. Grab groundwater samples contained up to 620 ppb TPHg and 4,400 ppb MtBE.

In March 2003, ERI submitted an Interim Remedial Action Plan (IRAP), which proposed the installation of a dual-phase extraction (DPE) and ozone sparging (OS) system to control the off-site migration of contaminants beneath the site (ERI, *Interim Remedial Action Plan*, March 18, 2003). The RWQCB-NCR approved the IRAP as stated in correspondence dated August 15, 2003. The RWQCB-NCR also requested further delineation of dissolved MtBE west of the site.

In September 2004, SECOR submitted a proposal to modify the IRAP, and a work plan for the installation of two off-site wells (MW-11 and MW-12) and performance of a DPE test at the site. SECOR recommended further delineation of off-site impacts and DPE feasibility testing to evaluate whether DPE is an effective remedial strategy for the site (SECOR, *Proposal to Modify Remediation Plan and Work Plan for Additional Off-Site Assessment*, September 3, 2004). The modified IRAP and work plan for additional off-site assessment were approved by the RWQCB-NCR in correspondence dated December 20, 2004.

Between March 8 and 10, 2005, SECOR performed DPE feasibility testing utilizing well EX-1 as the pumping well, and wells MW-2, MW-4, MW-7 and OB-1 as observation wells. The calculated TPHg, benzene, and MtBE mass removed during the DPE test were approximately 16.0 pounds, 0.02 pounds, and 0.21 pounds, respectively. Of the estimated mass removed, it was estimated that approximately 0.0039 pounds of TPHg, 0.0000057 pounds of benzene, and 0.0015 pounds of MtBE were removed from the extracted groundwater. Approximately 3,840 gallons of groundwater were extracted during the DPE test. Although DPE appeared to be an effective remedial option based on water level drawdown, high SVE and GWE extraction flow rates, and high soil vapor petroleum hydrocarbon removal rates observed during DPE testing, SECOR did not recommend installing a DPE system due to concentrations of tertiary butyl alcohol (TBA) detected at up to 2,000 micrograms per liter (µg/L) in groundwater. Based on the results of DPE feasibility testing, and the recommendations included in ERI's March 2003 IRAP, SECOR recommended that a soil vapor extraction (SVE) and OS system be installed at the site (SECOR, *Pilot Dual Phase Extraction Summary Report*, May 18, 2005).

The site has been monitored and sampled since the fourth quarter 1992. The highest concentrations of petroleum hydrocarbons, MtBE, and TBA have historically been detected in shallow on-site wells MW-4, MW-6, and MW-7 and shallow off-site well MW-9S, located north-northwest of the site. These wells are situated in the vicinity (MW-4 and MW-7), north (MW-6), and northwest (MW-9S) of the USTs and product dispensers. The direction of groundwater flow beneath the site has predominantly been toward the north and north-northwest.

## SENSITIVE RECEPTORS

In 2000, ERI conducted an agency and door-to-door groundwater receptor survey. According to files obtained from the California Department of Water Resources (DWR), a total of 22 wells were identified within a one-half mile radius of the site. Twenty were identified as domestic wells, and two were found to be irrigation wells. A quarter-mile radius door-to-door survey performed cross-gradient and downgradient of the site indicated the presence of nine water supply wells, including one municipal water supply well owned and maintained by the City of Santa Rosa. Six of these wells were reported

as being abandoned or not used; one well was reported as being used for irrigation purposes; and one well was reported as being used for drinking and irrigation purposes. The closest active water supply well to the site was a private domestic well located approximately 1,000 feet northwest of the site. ERI also performed a utility survey, which indicated the presence of several utilities beneath Vallejo Street and Farmers Lane. Results are further summarized in ERI's *Soil and Groundwater Investigation Report* dated May 25, 2000.

## MONITORING AND SAMPLING – SECOND QUARTER 2005

Currently, a total of 13 wells are monitored and sampled on a quarterly basis. Ten wells (MW-1 through MW-7, MW-8S, MW-9S, and MW-10) are screened in the shallow water bearing zone and three wells (MW-7D through MW-9D) are screened in the deeper zone (approximately 60 feet bgs). During the second quarter 2005, wells MW-9D and MW-9S were not sampled, as they were found to be covered with asphalt.

During the second quarter 2005, groundwater samples were collected from the site wells on May 24, 2005. The groundwater samples were submitted to Severn Trent Laboratories (STL) for analysis of TPHg by Environmental Protection Agency (EPA) Method 8015M; benzene, toluene, ethylbenzene, and total xylenes (BTEX) and MtBE by EPA Method 8021B; fuel oxygenates MtBE, tertiary amyl methyl ether (TAME), diisopropyl ether (DIPE), ethyl tertiary butyl ether (EtBE), TBA, ethanol, 1,2-DCA, and ethylene dibromide (EDB) by EPA Method 8260B.

## DISCUSSION

Depths to groundwater in the wells during the second quarter 2005 ranged from 8.83 to 13.03 feet bgs, which were within range of historical depths (6.48 feet to 17.46 feet bgs). Groundwater elevations ranged from 188.00 feet to 191.12 feet above mean sea level. Regional groundwater flow during the second quarter 2005 was northerly at a hydraulic gradient of 0.02 ft/ft, which is consistent with historical flow directions reported for the site. A regional groundwater elevation contour map was prepared by TRC using the monitoring data collected on May 24, 2005, and is presented in Attachment 1.

During the second quarter 2005, concentrations of petroleum hydrocarbons, MtBE and TBA, were detected in one or more wells screened in the shallow zone. Relatively minor concentrations of TPHg were detected in two wells at 110 µg/L (MW-4) and 140 µg/L (MW-7). Benzene was detected in one well (MW-4) at a concentration of 1.9 µg/L. Relatively minor concentrations of MtBE by EPA Method 8260B were detected in wells MW-1, MW-2, MW-4, MW-6, MW-7, and MW-8S; concentrations ranged from 0.79 µg/L (MW-1) to 47 µg/L (MW-7). Concentrations of TBA were reported in wells MW-4 (190 µg/L), MW-6 (92 µg/L), and MW-7 (1,600 µg/L). With the exception of a relatively minor detection of MtBE in well MW-7D (2.7 µg/L), deeper zone wells MW-7D and MW-8D did not contain concentrations of petroleum hydrocarbons and fuel oxygenates during the second quarter 2005. Dissolved TPHg, TPHd, benzene, MtBE, and TBA isoconcentration contour maps are included in TRC's *Quarterly Monitoring Report, April through June 2005* (Attachment 1).

## CHARACTERIZATION STATUS

Contamination in soil is adequately delineated. The majority of soil impact is limited to the capillary fringe in the area of the product dispensers.

The extent of dissolved impacts have been defined in the shallow zone by generally non-detectable concentrations of petroleum hydrocarbons and fuel oxygenates upgradient of the USTs and product dispensers (MW-3 and MW-10), and cross-gradient to downgradient to the northeast (MW-1 and MW-5). Although the downgradient extent of impacts have been defined by non-detectable concentrations of petroleum hydrocarbons and relatively low levels of MIBE in downgradient wells MW-8S and MW-9S north to northwest of the site, the extent of dissolved TBA has not been defined in the vicinity of well MW-9S. Shallow dissolved petroleum hydrocarbon and fuel oxygenate impacts have also not been defined west of the site.

The vertical extent of dissolved petroleum hydrocarbons and fuel oxygenates have generally been defined by non-detectable concentrations of petroleum hydrocarbons in deep zone wells MW-7D through MW-9D. With the exception of relatively low levels of MIBE in well MW-7D, the deep zone wells have historically not contained fuel oxygenates.

## WASTE DISPOSAL

The volume of purged groundwater generated during the second quarter 2005, and the method of disposal is included in TRC's *Quarterly Monitoring Report, April through June 2005* (Attachment 1).

## REMEDIAL STATUS

Approximately 65 tons of contaminated soil were removed from the site during product line removal and replacement activities in 2000. Currently, active remediation is not being performed at the site; however, in correspondence dated June 10, 2005, the RWQCB-NCR approved SECOR's recommendations as stated in SECOR's May 18, 2005 *Pilot Dual Phase Extraction Summary Report* for installing an SVE/OS system at the site.

## RECENT SUBMITTALS / CORRESPONDENCE

SECOR submitted the *Pilot Dual Phase Extraction Summary Report* on May 18, 2005. A response letter was subsequently received from the RWQCB-NCR on June 10, 2005, which indicated the RWQCB-NCR's approval of SECOR's recommendations for installing a SVE/OS system at the site. The RWQCB-NCR requested the submittal of a work plan detailing the installation of the SVE/OS system by July 25, 2005.

## THIS QUARTER ACTIVITIES (Second Quarter 2005)

1. SECOR submitted the *Quarterly Summary Report – First Quarter 2005* on April 28, 2005.
2. Groundwater monitoring and sampling activities were performed by TRC on May 24, 2005.
3. SECOR performed DPE feasibility testing between March 8 through 10, 2005, and submitted the *Pilot Dual Phase Extraction Summary Report* on May 18, 2005.
4. SECOR continued it's pursuit of obtaining a State of California, Department of Transportation (Cal-Trans) permit for the installation of two off-site wells (MW-11 and MW-12).


## NEXT QUARTER ACTIVITIES (Third Quarter 2005)

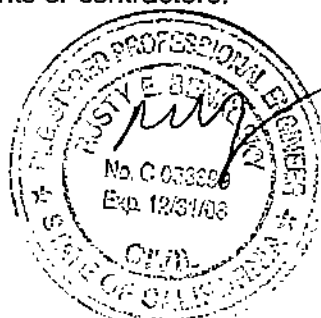
1. TRC will perform groundwater monitoring and sampling.
2. TRC will locate, uncover, and sample wells MW-9S and MW-9D during the third quarter monitoring event.
3. SECOR will submit the *Quarterly Summary Report – Second Quarter 2005*.
4. SECOR will submit a work plan detailing the installation of an SVE/OS system at the site by July 25, 2005.
5. Upon receipt of the Cal-Trans permit, SECOR will complete and submit a report documenting the results of off-site assessment activities by September 1, 2005.

## LIMITATIONS

This report presents our understanding of existing conditions at the subject site. The conclusions contained herein are based on the analytical results, and professional judgment in accordance with current standards of professional practice; no other warranty is expressed or implied. SECOR assumes no responsibility for exploratory borings or data reported by other consultants or contractors.

Sincerely,  
**SECOR International Incorporated**

  
Rusty E. Benkosky, P.E.  
Principal Engineer



Attachments: Attachment 1 – TRC's *Quarterly Monitoring Report, April Through June 2005* Dated July 11, 2005

**ATTACHMENT 1**  
**TRC'S QUARTERLY MONITORING REPORT,**  
***APRIL THROUGH JUNE 2005***  
**DATED JULY 11, 2005**

Quarterly Summary Report – Second Quarter 2005  
76 Service Station No. 11249  
1300 Farmers Lane  
Santa Rosa, California  
SECOR Project No.: 77CP.60007.03.0249



SEE TRC

2Q05 QMR